

CLAIMS

What is claimed is:

- 5 1. A method for processing a variable looping statement to enable loop unrolling, comprising:
- 10 determining an upper bound and a lower bound for a loop index within said variable looping statement;
- determining a condition that must be satisfied, said condition reflecting any conditions within an initial expression and an exit expression of said variable looping statement; and
- 15 forming a constant looping statement, wherein said upper bound and said lower bound define a range of values for a loop index within said constant looping statement, wherein said constant looping statement includes a nested conditional statement which tests said determined condition, wherein a body of said constant looping statement comprises a body of said variable looping statement, and wherein said body of said constant looping statement is only executed in the event that said determined condition is satisfied.
- 20
- 25 2. The method of claim 1, wherein said determining said condition comprises forming a logical "AND" of said initial condition of said variable looping statement and said exit condition of said variable looping statement.

3. The method of claim 1, further comprising determining whether said variable looping statement includes an increasing loop index value.

5 4. The method of claim 3, further comprising:

in the event that said variable looping statement includes said increasing loop index value, said determining of said lower bound comprises determining a lower bound of said initial expression of said variable looping statement.

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5. The method of claim 3, further comprising:

in the event that said variable looping statement includes said increasing loop index value, said determining of said upper bound comprises determining an upper bound of said exit expression of said variable looping statement.

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6. The method of claim 1 further comprising determining whether said variable looping statement includes a decreasing loop index value.

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7. The method of claim 6, further comprising:

in the event that said variable looping statement includes said decreasing loop index value, said determining of said lower bound comprises determining a lower bound of said exit expression of said variable looping statement.

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30 8. The method of claim 6, further comprising:

in the event that said variable looping statement includes said decreasing loop index value, said determining of said upper bound comprises determining an upper bound of said initial expression of said variable looping statement.

9. A system for processing a variable looping statement to enable loop unrolling, said system including a computer readable memory having one or more computer instructions stored thereon, said instructions comprising:

instructions operative to determine an upper bound and a lower bound for a loop index within said variable looping statement;

instructions operative to determine a condition that must be satisfied, said condition reflecting any conditions within an initial expression and an exit expression of said variable looping statement; and

instructions operative to form a constant looping statement, wherein said upper bound and said lower bound define a range of values for a loop index within said constant looping statement, wherein said constant looping statement includes a nested conditional statement which tests said determined condition, wherein a body of said constant looping statement comprises a body of said variable looping statement, and wherein said body of said constant looping statement is only executed in the event that said determined condition is satisfied.

10. The system of claim 9, wherein said instructions
operative to determine said condition comprise
instructions operative to form a logical "AND" of said
initial condition of said variable looping statement and
5 said exit condition of said variable looping statement.

11. The system of claim 9, further comprising
instructions operative to determine whether said variable
looping statement includes an increasing loop index
10 value.

12. The system of claim 11, further comprising:
instructions operative, in the event that said
variable looping statement includes said increasing loop
15 index value, to determine said lower bound by determining
a lower bound of said initial expression of said variable
looping statement.

13. The system of claim 11, further comprising:
20 instructions operative, in the event that said
variable looping statement includes said increasing loop
index value, to determine said upper bound by determining
an upper bound of said exit expression of said variable
looping statement.

14. The system of claim 9 further comprising
instructions operative to determine whether said variable
looping statement includes a decreasing loop index value.

15. The system of claim 14, further comprising:

instructions operative, in the event that said
variable looping statement includes said decreasing loop
index value, to determine said lower bound by determining
a lower bound of said exit expression of said variable
5 looping statement.

16. The system of claim 14, further comprising:

instructions operative, in the event that said
variable looping statement includes said decreasing loop
10 index value, to determine said upper bound by determining
an upper bound of said initial expression of said
variable looping statement.

17. A computer program product including a computer
readable medium, said computer readable medium having a
computer program stored thereon, said computer program
for processing a variable looping statement to enable
loop unrolling, said computer program comprising:

program code for determining an upper bound and a
20 lower bound for a loop index within said variable looping
statement;

program code for determining a condition that must
be satisfied, said condition reflecting any conditions
within an initial expression and an exit expression of
25 said variable looping statement; and

program code for forming a constant looping
statement, wherein said upper bound and said lower bound
define a range of values for a loop index within said
constant looping statement, wherein said constant looping
30 statement includes a nested conditional statement which

tests said determined condition, wherein a body of said
constant looping statement comprises a body of said
variable looping statement, and wherein said body of said
constant looping statement is only executed in the event
5 that said determined condition is satisfied.

18. A computer data signal embodied in a carrier wave,
said computer data signal including a computer program,
said computer program for processing a variable looping
statement to enable loop unrolling, said computer program
10 comprising:

program code for determining an upper bound and a
lower bound for a loop index within said variable looping
statement;

15 program code for determining a condition that must
be satisfied, said condition reflecting any conditions
within an initial expression and an exit expression of
said variable looping statement; and

program code for forming a constant looping
20 statement, wherein said upper bound and said lower bound
define a range of values for a loop index within said
constant looping statement, wherein said constant looping
statement includes a nested conditional statement which
tests said determined condition, wherein a body of said
25 constant looping statement comprises a body of said
variable looping statement, and wherein said body of said
constant looping statement is only executed in the event
that said determined condition is satisfied.

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19. A system for processing a variable looping statement to enable loop unrolling, comprising:

means for determining an upper bound and a lower bound for a loop index within said variable looping statement;

means for determining a condition that must be satisfied, said condition reflecting any conditions within an initial expression and an exit expression of said variable looping statement; and

means for forming a constant looping statement, wherein said upper bound and said lower bound define a range of values for a loop index within said constant looping statement, wherein said constant looping statement includes a nested conditional statement which tests said determined condition, wherein a body of said constant looping statement comprises a body of said variable looping statement, and wherein said body of said constant looping statement is only executed in the event that said determined condition is satisfied.